



Girls in Science Program

“Girls in Science” is a program developed by Wisconsin educators for girls interested in science, and participants learn about a variety of scientific fields, as well as understand the types of real-life problems scientists try to solve. This is accomplished through lecture, demonstration, experiments and hands-on activities.

The goals of “Girls in Science” are to offer intensive academic exploration, to provide students with the opportunity to work with other young women of similar abilities and interests, and to create conditions in which no one feels the need to hide their talents. The length of time for this activity is two days and the schedule includes a mix of class work, recreation, social activities and relaxation. Girls are assigned to three workshops based on their interests, one the first afternoon and two the following day. A parents’ program is also included to discuss with them the importance of encouraging their daughters to take more science.

When planning this type of activity, you might want to consider the following:

1. Funding—you always need money to support your project
2. Purpose and goals of program
3. Partnerships with other educational groups such as community colleges and universities to encourage faculty support and involvement
4. Topics of interest to determine session titles (See class descriptions)
5. Length of program, dates of program, location, materials, and cost (registration, food, and lodging)
Note: Weekends may work best so that parents can participate.
6. Eligibility of participant (grade level such as 5, 6, 7, and academic performance)
7. Availability of scholarships for students who may not be able to pay registration and lodging costs
8. Promotional strategies such as brochures, newsletter, posters, etc.
9. An opening presentation that will motivate and excite the participants and their parents
10. A closing activity to gather feedback from participants and parents.

Sample Class Descriptions

Programming with Turtle Logic. Computer programming is much like trying to teach a robot how to dance hip-hop when all it knows is how to take steps forward, backward, and from side to side. We will learn that our turtle robot can do amazing things by following a few simple commands.

Hands on Rehab for Injury Prevention and Recovery: What It Is? Who Can Do It? Participants will have the opportunity for hands on demonstrations of assessment and treatment techniques used in physical and occupational therapy. Anatomy and biomechanics laboratory exercises will be conducted in addition to experiencing the modalities of heat and cold and electrical stimulation, massage, and therapeutic exercises used for strengthening and conditioning.

Taking a Bite Out of Crime Using Molecular Biology. A jewelry store was robbed last night. The police have several suspects with good motives, but no evidence to charge any of them. Luckily for the police, the perpetrator cut him/herself on the broken store window, leaving blood on the glass at the scene of the crime. This was an unfortunate mistake for the thief in this age of molecular biology! The blood-spattered shards of glass have been taken to you, a member of the forensics lab team, to analyze the DNA in the blood by DNA fingerprinting analysis. Together, your team will perform molecular biology techniques with the DNA, analyze the results, and identify the criminal making your community safe once again.

Swimmers, Crawlers, and Floaters: Life in a Stream. Have you ever waded into a stream and explored what lives there? In this workshop, we will visit a local stream, slip into waders and search for aquatic insects. By turning over the stones and stirring up the mud, we will look for a variety of insects, such as dragonflies, caddis flies, and stoneflies. We'll compare the insects we find in terms of where they live (calm versus running water) and, what and how they eat.

Disease Detectives. This workshop explores infectious disease from two angles: epidemiology and diagnostics. We will simulate an outbreak of an infectious disease and trace it back to the initial case. We will then diagnose the pathogen with a technique called an ELISA test. Come see how modern disease trackers do their work.

Catch a Flying Car. A car is flying off a cliff. Where will it land? OK. For safety reasons we will use Hot Wheel cars. Using mathematics to model what is happening, we will be able to predict where they land and catch the cars. Have you ever wondered how the U.S. Forestry Service measures the heights of trees? Obviously they don't want to cut them down and they are a bit difficult to climb. We will construct a tool similar to what the Forestry Service uses and use it to measure trees and other tall objects on campus. The process is all about math.

Queue Tips. Have you ever been put on hold and wondered if you would get to talk to someone sooner if you just hung up and tried your call again? It all depends on how your call is being "queued". In this workshop we will investigate methods by which a company may provide service to customers, who arrive randomly, in such a way that company resources are conserved and waiting time is minimized. We'll create our own "company" and experiment with your ideas. You may be surprised with what you find.

Sample Class Descriptions (continued)

Vitamin C Survival. You have qualified to participate in a new “Survivor” TV contest. You can bring along ten items of food to the deserted jungle of Africa. Knowing that vitamin C is important for maintaining good health, you want to be sure to bring along foods that contain a lot of vitamin C. In this workshop you will determine the amount of vitamin C in a variety of foods and then determine what foods to bring along on your adventure to keep you healthy. Remember, these results could help you win \$1 million dollars!

Shards of the Past: Experimental Archaeology. Stones, bones and potsherds, these are often all that archaeologists have to reconstruct past life ways. Using artifacts, 12,000 years of prehistory records and experiments in stone tool manufacture and pottery making, we will explore how ancient people lived, adapted, and how archaeologists can reconstruct the past.

The Case of the Grumpy Grandmother. The wealthy octogenarian, Mrs. Josephine Grippenmacher, has always loved ice cream sundaes, sodas, and particularly root beer floats. But in the last few years, if she eats one of these or other dairy products, she has terrible stomach upsets. She was very unhappy until her doctor discovered that she had become lactose intolerant. With the help of an enzyme powder medication that catalyzes the digestion of lactose, she could once again enjoy ice cream. Recently, however, she has been having trouble even when she uses her powder. Has someone tampered with her enzyme because of all those years of being grumpy to her relatives and caregivers? Perhaps someone has added something to the powder or treated it in some way to decrease activity. Perhaps some other enzyme or chemical has been substituted for it? Or could it be that the brand she is using is not as active as it should be? She has saved some of the powder and it's up to you to find out the answers to her questions.

1...2...Chaos! When you are trying to sleep at night nothing is more predictable or annoying than the dripping of a water faucet. In fact, this seemingly simple system hides a wealth of complexity lurking just beneath its rhythmic, monotonous surface. We will investigate this system using simple physical principles like feedback and show that even the simplest systems can have surprisingly complex and interesting behavior. This complexity can be described using the Chaos Theory, the same Chaos Theory they talk about in the movie “Jurassic Park.”

Where in the World Are You? Have you ever wondered how a ship or airplane navigator figures out where he/she is going? How maps are made? In the old days (when your parents were young) directions were found using compasses, rulers, and clocks. Today we have satellites and can find where we are much more accurately (down to the inch). You'll learn how to use a satellite and Global Positioning System to find exactly where you are and make a map.

Fun and Games Using Probability and Statistics. What does it mean to be the mean or the median for that matter? Did you know that people playing games developed the rules of probability? We will investigate randomness, probability, and averages, and see how graphs and charts can be used to organize data and even make predictions. We will also see that uncertainty is one thing you can always count on!

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